

IN THE CLAIMS:

Please amend claim 1 as shown below, in which deleted terms are shown with strikethrough and added terms are shown with underscoring. Please cancel claim 2, without prejudice and without dedication or abandonment of the subject matter thereof. This listing of claims replaces all prior claim listings for this application.

1. (Currently Amended) A parking brake system comprising:

a casing having a hollow bore formed therein;

a parking piston slidably fitted into the casing, said parking piston configured and arranged so that a parking brake state can be obtained by forward movement of the parking piston in the bore in response to a parking control fluid pressure acting on a rear face side of the parking piston;

a lock mechanism provided within the casing to the rear of the parking piston, said lock mechanism configured to automatically lock in response to forward movement of the parking piston in order to mechanically lock the parking piston at a forward position thereof, and to unlock in response to a parking release control fluid pressure acting on the lock mechanism;

a fluid pressure source;

and a fluid pressure controller for controlling a fluid pressure generated by the fluid pressure source so that the parking control fluid pressure and the parking release control fluid pressure can be obtained;

wherein the lock mechanism comprises:

a lock piston that is slidably fitted into the casing to the rear of the parking piston, the lock piston arranged so that at least when the parking piston moves forward a forward urging force acts on the lock piston and such that a parking release control pressure can act on the lock piston toward the rear,

a spring provided in a compressed state between the casing and the lock piston so as to urge the lock piston forwardly in the casing,

a cylindrical retaining tube that is integrally and coaxially connected to a rear part of the parking piston,

a plurality of spheres that are respectively retained at a plurality of positions in the peripheral direction of the retaining tube so as to be movable in a direction along the radial direction of the retaining tube, and

an insertion shaft that is connected integrally to the front end of the lock piston so as to be axially relatively movably inserted into the retaining tube in order to sandwich the spheres between the insertion shaft and an inner face of the casing while contacting the spheres from the inside of the retaining tube; the casing and the insertion shaft being formed so as to position the spheres radially inward when the parking piston is at a retreat limit, and to position the spheres radially outward when the lock piston moves to a forward position in response to forward movement of the parking piston from the retreat limit,

wherein the insertion shaft has a plurality of guide grooves formed thereon and extending in the axial direction thereof, the guide grooves being provided on the outer face of the insertion shaft, the guide grooves having a concavely curved cross-sectional shape with a diameter that is equal to or larger than the diameter of the spheres so that part of each sphere is rollably fitted into a respective one of the guide grooves, and

the casing having a restricting step provided on the inner face thereof, said restricting step capable of abutting, from the rear, against the spheres pushed radially outward by the insertion shaft when the lock piston is at the forward position thereof.

2. (Canceled)

3. (Previously Presented) The parking brake system of claim 1, wherein the insertion shaft comprises a small diameter shaft portion and a large diameter shaft portion coaxially and integrally connected via a tapered portion that changes the contact position of each of the spheres from the smaller diameter shaft portion to the large diameter shaft portion in response to a forward movement of the lock piston.

4. (Previously Presented) The parking brake system of claim 1, wherein the lock piston integrally includes a small diameter portion slidably fitted into the casing and a large diameter portion coaxially connected to a rear part of the small diameter portion while forming a forward facing annular step between the large diameter portion and a rear portion of the small diameter portion.

5. (Previously Presented) The parking brake system of claim 4, wherein at least one annular seal is mounted on an outer periphery of the small diameter portion of the lock piston and at least one annular seal is mounted on the outer periphery of the large diameter portion of the lock piston.

6. (Previously Presented) The parking brake system of claim 5, wherein the annular seals seal a parking release control fluid pressure chamber from opposite sides in the axial direction.

7. (Previously Presented) The parking brake system of claim 1, wherein the casing bore includes a slide hole having a first diameter, which slidably receives a portion of the parking piston, and a guide hole coaxially connected to the slide hole and having a second diameter which is smaller than the first diameter, the guide hole configured to slidably receive the retaining tube therein, wherein a tapered, forward-facing restricting step is formed in the casing bore between the guide hole and the slide hole.